IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Serial No. 10/736,446
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09/18/2007 /Pamela Gerik/
Date Pamela Gerik

APPEAL BRIEF

Sir/Madam:

Further to the Notice of Appeal filed July 20, 2007, Appellant presents this Appeal Brief. The Notice of Appeal was filed following receipt of a final Office Action mailed May 23, 2007 and a subsequent Advisory Action mailed August 2, 2007. Appellant hereby appeals to the Board of Patent Appeals and Interferences from the rejection of pending claims 9-16 and respectfully requests that this appeal be considered by the Board.

I. REAL PARTY IN INTEREST

The subject application is owned by Schleifring und Apparatebau GmbH as evidenced by the document recorded at reel 015393 and frame 0082.

II. RELATED APPEALS AND INTERFERENCES

No appeals, interferences, or judicial proceedings are known which would directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

Claims 9-16 stand rejected and are the subject of this appeal. Claims 1-8 were canceled.

IV. STATUS OF AMENDMENTS

Claim 12 was amended subsequent to the final rejection. Such amendment was entered as noted in the Advisory Action mailed August 2, 2007. Therefore, the Appendix hereto reflects the current state of the claims.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 9 describes a device for broadband transmission of digital optical signals between at least one first unit and at least one second unit traveling relative to the first unit along a given track, the device comprising (Specification -- pg. 2, lines 13-22), in association with the first unit: a data source for generating a serial data stream; an optical transmitter for generating optical signals from the serial data stream of the data source (Specification -- pg. 3, lines 8-9; pg. 3, lines 17-20); an optical waveguide for guiding the optical signals generated by the optical transmitter (Specification -- pg. 3, lines 10-11); and comprising, in association with the second unit: a coupling element for tapping optical signals from the optical waveguide (Specification -- pg. 3, lines 12-13); an optical receiver for receiving the signals tapped by the coupling element (Specification -- pg. 3, lines 13-15); a data sink for further processing the signals received by the optical receiver (Specification -- pg. 3, lines 22-24); an evaluation means comprising a micro controller and memory coupled to the receiver for measuring a value corresponding to an operating characteristic of a transmission path between the transmitter and receiver (Specification -- pg. 6, lines 1-3 and 18-21); and a controller coupled to the data source for receiving the value from the micro controller, and to modify the data rate or data package size depending on whether the value differs from a desired value (Specification -- pg. 3, lines 26-31; pg. 7; lines 1-5).

Independent claim 10 describes a device for broadband transmission of digital optical signals between at least one first unit and at least one second unit traveling relative to the first unit along a given track (Specification -- pg. 2, lines 13-22), the device comprising, in association with the first unit: a data source for generating a serial data stream; an optical transmitter for generating optical signals from the serial data stream of the data source (Specification -- pg. 3, lines 8-9 and 17-20); an optical waveguide for guiding the optical signals generated by the optical transmitter (Specification -- pg. 3, lines 10-11); and comprising, in association with the second unit: a coupling element for tapping optical signals from the optical waveguide; an optical receiver for receiving the signals tapped by the coupling element (Specification -- pg. 3, lines 12-15); a data sink for further processing the signals received by the optical receiver (Specification -- pg. 3, lines 22-24); a measuring device coupled to the optical receiver for measuring a value corresponding to an operating characteristic of the optical waveguide, selected from the group consisting of signal-to-noise differences, bit error rate, and relative positions between the first and second units (pg. 5, lines 1-2 and 21-23); a micro controller for receiving the measured value and storing said value in memory if the value differs from a desired value (Specification -- pg. 6, lines 18-21); and a controller coupled between the data source and the optical transmitter for receiving the stored value and for modifying the data rate or data package size sent from the optical transmitter (Specification -- pg. 3, lines 26-31; pg. 7, lines 1-5).

Independent claim 16 describes a method for broadband transmission of digital signals between at least one first unit and at least one second unit traveling relative to the first unit along a given track (Specification -- pg. 2, lines 13-22; pg. 7, lines 13-18), the method comprising the steps of: generating from a data source at the first unit a serial data stream (Specification -- pg. 3, lines 8-9); generating optical signals from the serial data stream of the data source with an optical transmitter at the first unit (Specification -- pg. 3, lines 17-20); guiding the optical signals generated with the optical transmitter along an optical waveguide (Specification -- pg. 3, lines 10-11); tapping optical signals from the optical waveguide with a coupling element at the second unit (Specification -- pg. 3, lines 12-13); receiving the optical signals tapped with the coupling element with an optical receiver at the second unit (Specification -- pg. 3, lines 13-15); further processing the signals received by the optical receiver at a data sink at the second unit

(Specification -- pg. 3, lines 22-24); performing dynamically during transmission of the digital signals (Specification -- pg. 6, lines 30-32): measuring the signals received by the optical receiver for determining a value which is representative of transmission characteristics of a data path between the transmitter and the receiver (Specification -- pg. 5, lines 1-2 and lines 21-23; pg. 7, lines 1-3); and setting a data rate or a size of data packages for transmission along the data path in accordance with a comparison between the measured value and a desired value (Specification -- pg. 3, lines 26-31; pg. 7, lines 1-5).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 9-12 and 14-16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of U.S. Patent No. 5,535,033 to Guempelein et al. (hereinafter "Guempelein") and U.S. Patent Application Publication No. 2003/0095508 to Kadous et al. (hereinafter "Kadous").

2. Claim 13 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Guempelein, Kadous, and U.S. Patent No. 5,659,368 to Landis (hereinafter "Landis").

VII. ARGUMENT

The contentions of the Appellant with respect to the ground of rejection presented for review, and the basis thereof, with citations of the statutes, regulations, authorities, and parts of the record relied upon are presented herein for consideration by the Board. Details as to why the rejections cannot be sustained are set forth below.

1. **Rejection of Claims 9-12 and 14-16**

Claims 9-16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Guempelein and Kadous, or the combination of Guempelein, Kadous, and Landis. To establish a case of *prima facie* obviousness of a claimed invention, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. Second, there must be a reasonable expectation of success. As stated in MPEP 2143.01, the fact that references can be hypothetically combined or modified is not sufficient to establish a *prima facie* case of obviousness. *See In re Mills*, 916 F.2d. 680 (Fed. Cir. 1990). Finally, the prior art references must teach or suggest <u>all</u> the claim limitations. *In re Royka*, 490 F.2d. 981 (CCPA 1974); MPEP 2143.03. Specifically, "all words in a claim must be considered when judging the patentability of that claim against the prior art." *In re Wilson* 424 F.2d., 1382 (CCPA 1970).

Moreover, in response to the recent U.S. Supreme Court decision in *KSR Int'l Co. v. Teleflex, Inc.* (U.S. 2007), new guidelines were set forth for examining obviousness under 35 U.S.C. § 103. The U.S. Supreme Court reaffirmed the *Graham* factors and, while not totally rejecting the "teachings, suggestion, or motivation" test, the Court appears to now require higher scrutiny on the part of the U.S. Patent & Trademark Office. In accordance with the recently submitted guidelines, it is "now necessary to identify the reason" why a person of ordinary skill in the art would have combined the prior art elements, or at least describe the pertinence of the prior art elements set forth in the cited disclosure, in the manner presently claimed. Moreover, even if combined, the *Graham* factors require that a determination of the differences between the combined prior art and the claims at issue is needed. Using these standards, Applicants contend that the Office Action fails to identify the reasons for combining the cited references and, even if combined, fails to note substantial differences between the combined references and the claims at issue. Some distinctive features of the presently pending claims are set forth in more detail below.

There are no reasons identified as to why a skilled artisan would have combined a non-measurable optical transmission path of Guempelein with a measurable non-optical transmission path of Kadous to arrive at the claimed micro controller and memory coupled to an optical receiver for measuring a value corresponding to an operating characteristic of an optical wavegude transmission path. Independent claims 9, 10, and 16 each describe a device or method for transmission of digital optical signals. For example, an optical transmitter sends the optical signals along an optical waveguide to an optical receiver. Note, however, in each case, the word "optical" is used throughout each of the independent claims. A micro controller and memory can be coupled to the optical receiver for measuring a value corresponding to an operating characteristic of the optical waveguide transmission path between the transmitter and receiver.

Guempelein describes an optical conductor 1 with a detector 10 movable along conductor 1 (Guempelein -- col. 2, lines 54-67; Fig. 2). Detector 10 can detect light pulses sent through optical conductor 1, and forwards such pulses to demodulation unit 11 and receiver 12 (Guempelein -- col. 2, lines 31-53). Importantly, however, nowhere in Guempelein is there any mention, suggestion, theorization, or skilled imagination rendered toward measuring a value or otherwise corresponding to the operating characteristics of conductor 1. Instead, detector 10 is suitable only for measuring the modulated signal placed into conductor 1 via modulation unit 5 (Guempelein -- col. 2, lines 39-45).

Kadous describes a <u>wireless</u> communication system (Kadous -- ¶¶ 0005, 0020, 0024, etc.). Many wireless communication systems implement what is known as orthogonal frequency division multiplex (OFDM) modulation (Kadous -- ¶ 0005). However, when multiple channels are used, the data rate in each channel may be different from "subchannel to subchannel" (Kadous -- ¶ 0007). In order to alleviate this problem, the wireless communication system of Kadous implements a fast Fourier transformer (FFT) 160 that receives data samples and provides those samples as OFDM symbols to a demodulator/decoder 162 (Kadous -- ¶ 0025). A channel estimator 164 estimates the various characteristics of the wireless communication channel, such estimates might include signal-to-noise and channel noise variance (Kadous -- ¶ 0025). Based on the estimated rate, channel estimator 164 can determine a suitable rate by applying the

estimate to a rate selector 166 that selects a suitable rate based on that channel estimate (Kadous -- ¶ 0026). Thus, Kadous illustrates a rate selector 166 that functions similar to a table: when a channel response estimate is input to the rate selector 166, an appropriate rate is selected and sent to control 170, and back to the data source 112 via feedback control 130 (Kadous -- Fig. 1A). Rate selector 166 serves as a transfer function, with various transfer functions shown throughout Kadous (Kadous -- Fig. 1B).

While Kadous illustrates the feasibility of measuring a value corresponding to an operating characteristic of a transmission path, nowhere in Kadous is there any mention of being able to couple optical signals from a transmission path since Kadous is specifically limited to the problems associated with wireless transmission. As a skilled artisan would know, wireless transmission and, specifically, OFDM modulation in wireless transmission, would not point such an artisan toward optical communication, much less coupling light signals from a waveguide as claimed.

Accordingly, Appellants believe it is impermissible to combine what is clearly a solution to OFDM wireless modulation in exclusively a wireless communication system in Kadous with an exclusively optical communication system of Guempelein to arrive at the subject matter of independent claims 9, 10, and 16. Absent a proper combination or any specific reason as to why a skilled artisan would combine the solely wireless system of Kadous with the solely optical system of Guempelein, Appellants believe independent claims 9, 10, and 16 are patentably distinct over the cited art.

There are no reasons identified as to why a skilled artisan would have combined a non-controllable/non-modifiable data rate of optical transmission signals in Guempelein with controllable/modifiable data rate of non-optical transmission signals of Kadous to arrive at the claimed controller for controlling/modifying the data rate of optical signals for and optical receiver. Each of the independent claims 9, 10, and 16 not only describe measuring a value corresponding to the operating characteristics of an optical waveguide, but also describe a controller for controlling or modifying the data rate of optical signals from an optical transmitter based on that measured value.

While Kadous does describe controlling the data rate of a data source, Kadous is specifically limited to solving the problems of OFDM within a wireless transmitter. Nowhere is there any possibility for ignoring the problem and solution within an OFDM modulation technique, limited to wireless communication within Kadous. Moreover, nowhere is there any mention that OFDM, wireless communication, and the problems of OFDM modulation within wireless communication can be ignored and the controlling solution of Kadous be applied to an optical transmitter. Simply put, optical transmitters do not suffer fading and multi-path effects or SNR issues in a OFDM environment. Therefore, a skilled artisan would not look to Kadous for controlling or modifying a data rate within an optical transmitter. The shortcomings of Kadous are compounded in Guempelein.

Guempelein, in no way, makes it possible for controlling the data rate of its optical transmitter via use of a measured value or any value corresponding to an operating characteristic of an optical waveguide transmission path. Absent any control feature or suggestion in Guempelein, Appellants believe the suggestion of control, albeit solely within a wireless environment in Kadous, would not suffice to render independent claims 9, 10, and 16 unpatentable.

The Office Action concedes the shortcomings Guempelein as a measuring or controlling device, and that Guempelein does not describe any evaluation, measuring, or controlling mechanisms -- certainly not a micro controller and memory for measuring a transmission path characteristic value. However, since Kadous is specifically limited to wireless communication systems and, specifically, OFDM modulation problems associated with wireless transmission, Appellants believe the combination of Guempelein and Kadous cannot be sustained. It appears the Examiner may be taking undue liberties and applying hindsight to pick and choose feature of various references that are in quite dissimilar fields of endeavor. Despite the statements made on page 4 of the final Office Action, Kadous is not in the same field of endeavor as Guempelein, and certainly does not describe a field of endeavor related to optical communication systems as presently claimed.

The combination of Guempelein and Kadous (even if properly combined) does not teach, suggest, or motivate modification of the data rate depending on whether a measured value differs from a desired value. Each of the present independent claims 9, 10, and 16 describe the concepts of "comparing." Specifically, claims 9, 10, and 16 describe comparing a measured value relative to a desired value. If the measured value differs from the desired value, then the data rate can be modified. Conversely, if the measured value does not differ from the desired value, then the data rate is not modified. Therefore, modification only occurs in certain instances where the comparison yields a positive (or different) result.

Clearly, Guempelein does not perform any comparison, much less a comparison between a measured value and a desired value. A closer examination of Kadous also reveals the fact that Kadous does not compare a measured value with a desired value, and modify the data rate if the measured value differs from the desired value. Instead, Kadous simply describes rate selection. The rate selection is that by which selector 166 receives an estimate from channel estimator 164 (Kadous -- ¶ 0026). Therefore, for each channel estimate output from estimator 164, a corresponding rate is sent from rate selector 166 (Kadous -- ¶ 0026). Rate selector 166 chooses a corresponding rate for each estimate or parameter based on the transfer function or multiple transfer functions linked to one another (Kadous -- ¶¶ 0041-0043; Fig. 1B). Therefore, instead of comparing the measured value or transmission parameter with a desired value, Kadous specifically takes the measured value and applies it to a transfer function to arrive at a data rate. The benefit of modifying the data rate only if the comparison yields a positive result (i.e., the measured value differs from the desired value) is that the present invention utilizes less computational effort, and does not disturb or cause changes to the controller at the transmitter if the measured value does not differ from the desired value. Absent any comparison functionality or selective modification based on a comparison, Appellants believe that the combination of Guempelein and Kadous does not teach, suggest, or motivate a skilled artisan to arrive at the present claimed invention.

For at least the reasons set forth above, Appellants believe claims 9, 10, and 16 are patentably distinct over the cited art. In addition, dependent claims 11-15 are believed patentably distinct for the same reasons as their respective base claim.

2. Rejection of Claim 13

Claim 13 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Guempelein, Kadous, and Landis. Appellants believe dependent claim 13 is patentably distinct over the cited references for at least the same reasons as its base claim 9 or 10 discussed above.

Moreover, the combination of Guempelein, Kadous, and Landis does not teach, suggest, or motivate a measuring device between an optical receiver and data sink (i) for signaling incorrectly transmitted data via an auxiliary transmission channel, and (ii) for repeating a transmission of incorrectly received data packages. Present claim 13 describes a measuring device placed between an optical receiver and a data sink. The measuring device can signal incorrectly transmitted data from the micro controller back to the controller via an auxiliary transmission channel (Specification -- Fig. 1). Once the controller receives a message that the transmitted data is incorrectly sent, then the controller can repeat the transmission.

As discussed above, Guempelein does not measure and certainly does not connote signaling incorrectly transmission data via an auxiliary transmission channel. While Kadous describes a feedback from a receiver back to a transmitter, Kadous does not illustrate signaling incorrectly transmitted data using an auxiliary transmission channel. Realizing the shortcomings of Guempelein and Kadous, the Examiner introduces Landis as providing the missing claimed features. Appellants respectfully disagree. Not only does Landis fail to suggest an optical transmission environment, but Landis specifically does not describe an auxiliary transmission channel, such as an optical waveguide transmission channel. Moreover, Landis does not suggest a measuring device between an optical receiver and data sink as claimed. Therefore, Appellants believe the rejection of claim 13 over the combination of Guempelein, Kadous, and Landis cannot be sustained.

* * *

For the foregoing reasons, it is submitted that the Examiner's rejection of and objection to pending claims 9-16 was erroneous, and reversal of the Examiner's decision is respectfully requested.

The Commissioner is hereby authorized to charge the required fee(s) or credit any overpayment to Daffer McDaniel, LLP deposit account number 50-3268.

Respectfully submitted,

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KLD

VIII. APPENDIX

The present claims on appeal are as follows.

9. A device for broadband transmission of digital optical signals between at least one first unit and at least one second unit traveling relative to the first unit along a given track, the device comprising, in association with the first unit:

a data source for generating a serial data stream; an optical transmitter for generating optical signals from the serial data stream of the data source;

an optical waveguide for guiding the optical signals generated by the optical transmitter; and

comprising, in association with the second unit:

a coupling element for tapping optical signals from the optical waveguide;

an optical receiver for receiving the signals tapped by the coupling element;

a data sink for further processing the signals received by the optical receiver;

an evaluation means comprising a micro controller and memory coupled to the receiver for measuring a value corresponding to an operating characteristic of a transmission path between the transmitter and receiver; and

a controller coupled to the data source for receiving the value from the micro controller, and to modify the data rate or data package size depending on whether the value differs from a desired value.

10. A device for broadband transmission of digital optical signals between at least one first unit and at least one second unit traveling relative to the first unit along a given track, the device comprising, in association with the first unit:

a data source for generating a serial data stream; an optical transmitter for generating optical signals from the serial data stream of the data source;

an optical waveguide for guiding the optical signals generated by the optical transmitter; and

comprising, in association with the second unit:

a coupling element for tapping optical signals from the optical waveguide; an optical receiver for receiving the signals tapped by the coupling element;

a data sink for further processing the signals received by the optical receiver;

a measuring device coupled to the optical receiver for measuring a value corresponding to an operating characteristic of the optical waveguide, selected from the group consisting of signal-to-noise differences, bit error rate, and relative positions between the first and second units;

a micro controller for receiving the measured value and storing said value in memory if the value differs from a desired value; and

a controller coupled between the data source and the optical transmitter for receiving the stored value and for modifying the data rate or data package size sent from the optical transmitter.

11. The device according to claim 10, wherein the controller is configured for storing data, and also for transmitting stored data at varying data rates to the transmitter.

12. The device according to claim 9 or 10, wherein the desired value is set according to the actually prevailing transmission characteristics of the data path between the optical transmitter and the optical receiver.

13. The device according to claim 9 or 10, wherein the measuring device is provided between the optical receiver and the data sink, wherein the measuring device has additional means for signaling incorrectly transmitted data via the micro controller to the controller by means of an auxiliary transmission channel, and wherein the controller is adapted to repeat a transmission of incorrectly received data packages upon request by the evaluation means.

14. The device according to claim 9 or 10, wherein the micro controller is provided for control and diagnosis of the device.

15. The device according to claim 9 or 10, wherein the device is self-learning and during operation dynamically adapts to currently prevailing operating conditions.

16. A method for broadband transmission of digital signals between at least one first unit and at least one second unit traveling relative to the first unit along a given track, the method comprising the steps of:

generating from a data source at the first unit a serial data stream;

generating optical signals from the serial data stream of the data source with an optical transmitter at the first unit;

guiding the optical signals generated with the optical transmitter along an optical waveguide;

tapping optical signals from the optical waveguide with a coupling element at the second unit;

receiving the optical signals tapped with the coupling element with an optical receiver at the second unit;

further processing the signals received by the optical receiver at a data sink at the second unit;

performing dynamically during transmission of the digital signals:

measuring the signals received by the optical receiver for determining a value which is representative of transmission characteristics of a data path between the transmitter and the receiver; and

setting a data rate or a size of data packages for transmission along the data path in accordance with a comparison between the measured value and a desired value.

IX. EVIDENCE APPENDIX

No evidence has been entered during the prosecution of the captioned case.

X. RELATED PROCEEDINGS APPENDIX

No prior or pending appeals, interferences, or judicial proceedings are known to Appellant or Assignee which would directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.